# PART 223

## PETROLEUM REFINERIES

(Statutory authority: Environmental Conservation Law, §§ 3-0301, 19-0301, 19-0303)



**Historical Note**

Part (§§ 223.1-223.3) filed July 12, 1972; repealed, new (§§ 223.1-223.8) filed July 24, 1979 eff. 30 days after filing.

**Section 223.1 Applicability.** This Part shall apply to all petroleum refineries, except for sections 223.7 and 223.10 which apply only to those petroleum refineries located in a nonattainment area for ozone.

**Historical Note**

Sec. filed July 12, 1972; repealed, new filed July 24, 1979; renum. 223.2, new filed April 10, 1981 eff. 30 days after filing.

**223.2 Definitions.** (a) For the purpose of this Part, the general definitions of Part 200 of this Title shall apply.

(b) For the purpose of this Part, the following definitions will also apply:

(1) *Afterburner.* A catalytic and/or thermal combustion device used to control air contaminant emissions.

(2) *Coke burn-off.* The coke removed from the surface of the fluid catalytic cracking unit catalyst by combustion in the catalyst regenerator.

(3) *Component.* Any piece of equipment which has the potential to leak volatile organic compounds when tested in the manner described in section 223.10(c) of this Part. These include, but are not limited to, pump seals, compressor seals, seal oil degassing vents, pipeline valves, flanges and other connections, pressure relief devices, process drains, and open-ended pipes. Excluded from these are valves which are not externally regulated.

(4) *Fuel gas.* Gas generated at a petroleum refinery or any gas generated by a refinery process unit, which is combusted separately or in any combination with any type of natural gas. *Fuel gas* does not include gases generated by catalytic cracking unit catalyst regenerators and fluid coking burners.

(5) *Fuel gas combustion device.* Any equipment, such as process heaters, boilers and flares, used to combust fuel gas, except facilities in which gases are combusted to produce sulfur or sulfuric acid.

(6) *Gas service.* Any equipment which processes, transfers or contains a volatile organic compound or mixture of volatile organic compounds in the gaseous phase.

(7) *Hot well.* The collection container for condensed volatile organic compounds.

(8) *Light petroleum compound.* A petroleum derivative for which the temperature at 10 percent recovery is lower than 205° C when tested in accordance with ASTM D86, Standard Method for Distillation of Petroleum Products.

(9) *Liquid service*. Any equipment which processes, transfers or contains a volatile organic compound or mixture of volatile organic compounds in the liquid phase.

(10) *Noncondensate vapors*. Gases removed from process units by a vacuum producing system. As used in this Part, the term applies to the portion of volatile organic compounds which have not become liquid in condensers.

(11) *Petroleum*. The oil removed from the earth and the oil derived from tar sands, shale and coal.

(12) *Petroleum refinery*. Any facility engaged in producing gasoline, aromatics, kerosene, distillate fuel oils, residual fuel oils, lubricants, asphalt, or other products through distillation of petroleum or through redistillation, cracking, rearrangement or reforming of unfinished petroleum derivatives.

(13) *Process gas*. Any gas generated by a petroleum refinery process unit, except fuel gas and process upset gas as defined in this section.

(14) *Process unit turnaround*. The process of shutdown, inspection, repair and start-up of reactors, fractionators, or other process units.

(15) *Process upset gas*. Any gas generated by a petroleum refinery process unit as a result of a start-up, shut-down, upset or malfunction.

(16) *Refinery process unit*. A set of components which are a part of a basic process operation, such as distillation, hydrotreating, cracking or reforming of hydrocarbons.

(17) *Vacuum producing systems*. Equipment used to produce and maintain a vacuum in petroleum refinery process equipment as steam ejectors which contact condensers or surface condensers and mechanical vacuum pumps.

(18) *Valves not externally regulated*. Valves that have no external controls, such as in-line check valves.

(19) *Wastewater separators*. Equipment used to separate oils and water from locations downstream of process drains.

**Historical Note**

Sec. filed July 12, 1972; repealed, new filed July 24, 1978, renum. 223.3, new added by renum and amd. 223.1, filed April 10, 1981; amd. filed March 7, 1983 eff. 30 days after filing. Amended (b).

**223.3 Particulate emissions.** (a) *Existing emission sources*. No person shall cause or allow emission of particulates to the outdoor atmosphere from any existing fluid catalytic cracking unit catalyst regenerator or fluid catalytic unit incinerator-waste heat boiler in excess of 0.15 grain per cubic foot of exhaust gas, expressed at standard conditions on a dry gas basis. An existing emission source is one for which an application for a permit to construct was received, pursuant to Part 201 of this Subchapter, prior to June 12, 1973.

(b) *New emission sources and modifications*. (1) No person shall cause or allow emission of particulates to the outdoor atmosphere from any fluid catalytic cracking unit catalyst regenerator or fluid catalytic cracking unit incinerator-waste heat boiler or modification thereof, for which an application for a permit to construct is received by the commissioner pursuant to Part 201 of this Title, subsequent to June 11, 1973, in excess of 1.0 pound per 1,000 pounds of coke burn-off in the catalyst regenerator.

(2) In those instances in which auxiliary liquid and/or solid fuels are burned in the fluid catalytic cracking unit incinerator-waste heat boiler, particulates in excess of that permitted by subdivision (a) of this section may be emitted to the outdoor atmosphere, except that the incremental rate of particulate emissions shall not exceed 0.10 lb per million Btu heat input attributable to such liquid and/or solid fuel.

**Historical Note**

Sec. filed July 24, 1979; renum. 223.4, new added by renum. and amd. 223.2, filed April 10, 1981; amd. filed July 10, 1984 eff. 30 days after filing. Amended (b)(1)-(2).

**223.4 Opacity of emissions.** (a) No person subject to the provisions of this Part will allow or cause emissions to the outdoor atmosphere of gases from any fluid catalytic cracking unit catalyst regenerator exhibiting greater than 30 percent opacity except for one six-minute average opacity reading in any one-hour period.

(b) Except as provided in subdivision (a) of this section, no person subject to the provisions of this Part shall allow or cause emissions to the outdoor atmosphere having an opacity of 20 percent or greater.

(c) All refinery flares shall be equipped with smokeless tips.

**Historical Note**

Sec. filed July 24, 1979; renum. 223.5, new added by renum. 223.3, filed April 10, 1981; amds. filed: March 7, 1983; July 10, 1984 eff. 30 days after filing. Amended (a).

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**223.5 Carbon monoxide emissions.** (a) *Existing emission sources.* No person shall cause or allow emissions of carbon monoxide to the outdoor atmosphere from any existing fluid catalytic cracking unit catalyst regenerator in excess of the amount permitted by table 2, section 212.9(b) of this Title.

(b) *New emission sources and modifications.* No person shall cause or allow emissions to the outdoor atmosphere of carbon monoxide from any new fluid catalytic cracking unit catalyst regenerator or modification thereof, for which an application for a permit to construct is received by the commissioner pursuant to Part 201 of this Title, subsequent to June 11, 1973, in excess of 0.05 percent by volume of exhaust gases.

**Historical Note**

Sec. filed July 24, 1979; renum. 223.6, new added by renum. and amd. 223.4, filed April 10, 1981 eff. 30 days after filing.

**223.6 Sulfur compound emissions.** (a) *Existing emission sources.*

(1) No person shall burn in an existing fuel gas combustion device any gas which contains sulfur compounds measured as hydrogen sulfide in excess of 50 grains per 100 standard cubic feet of gas.

(2) No person shall cause or allow emissions of any sulfur compound into the outdoor atmosphere from any existing Claus sulfur recovery unit in excess of the amount permitted by table 2, section 212.9(b) of this Title.

(b) *New emission sources and modifications.* (1) No person shall burn in a fuel gas combustion device or modification thereof, for which an application for a permit to construct is received by the commissioner pursuant to Part 201 of this Title, subsequent to June 11, 1973, any fuel gas which contains hydrogen sulfide in excess of 10 grains per 100 standard cubic feet of gas.

(2) A source owner burning a fuel gas containing sulfur compounds in excess of that allowed in paragraph (1) of this subdivision may elect to treat the resulting gases in a manner which limits the release of sulfur compounds to the outdoor atmosphere if he can show to the satisfaction of the commissioner that this results in the reduction of sulfur compound emissions as effectively as compliance with the requirements of paragraph (1) of this subdivision.

(3) No person shall emit any gases into the outdoor atmosphere from any Claus sulfur recovery unit for which an application for a permit to construct is received by the commissioner pursuant to Part 201 of this Title, subsequent to October 4, 1976, containing in excess of:

(i) 0.025 percent by volume of sulfur dioxide at zero percent oxygen on a dry basis if emissions are controlled by an oxidation system or a reduction system followed by an afterburner;

(ii) 0.03 percent by volume of reduced sulfur compounds and 0.001 percent by volume of hydrogen sulfide (calculated as $SO_2$) at zero percent oxygen on a dry basis if emissions are controlled by a reduction system not followed by an after-burner.

**Historical Note**

Sec. filed July 24, 1979; renum. 223.7, new added by renum. and amd. 223.8, filed April 10, 1981; amd. filed July 10, 1984 eff. 30 days after filing. Amended (a)(3).

**223.7 Volatile organic compound emissions.** (a) Any person subject to this section is required to submit to the commissioner by June 1, 1982 or such later date as determined by an order of the commissioner such evidence as may be required by the commissioner to show compliance with the provisions of this section.

(b) All noncondensable vapors from any vacuum-producing system shall be piped to a firebox or afterburner, or compressed and added to refinery fuel gas. All hot wells associated with contact condensers shall be covered and the vapors shall be treated with an afterburner.

(c) All forebays and separator sections which recover 200 gallons per day or more of volatile organic compounds shall be designed to prevent the escape of volatile organic compounds.

(d) During process unit turnaround, processing units shall be depressurized down to 5 psig and the volatile organic compounds shall be vented to a vapor recovery system or to the fuel gas system, or flared.

(e) Alternate methods for controlling the emission of volatile organic compounds may be acceptable if the source owner can show to the satisfaction of the commissioner that the methods utilized constitute reasonably available control technology.

**Historical Note**

Sec. filed July 24, 1979; renum. 223.8, new added by renum. and amd. 223.8, filed April 10, 1981; amd. filed March 7, 1983 eff. 30 days after filing.

**223.8 Exceptions.** Pressure relief devices which are connected to an operating flare header or vapor recovery devices, inaccessible valves, valves that are not externally regulated, pipeline flanges and pressure relief valves in liquid service are exempt from the monitoring requirements of section 223.10 of this Part.

**Historical Note**

Sec. filed July 24, 1979, renum. 223.9, new added by renum. and amd. 223.7, filed April 10, 1981; amd. filed March 7, 1983 eff. 30 days after filing.

**223.9 Monitoring of confined process emissions and operations.** (a) Any source owner subject to the provisions of this Part shall install, calibrate, maintain and operate a continuous emission monitoring system for:

(1) the measurement of opacity of emissions from each fluid catalytic cracking unit catalyst regenerator;

(2) continuously monitoring and recording the concentration of carbon monoxide in emissions to the outdoor atmosphere from any new fluid catalytic cracking unit catalyst regenerator. An instrument with a span of 1000 ppm shall be used;

(3) the measurement of sulfur dioxide in the emissions to the outdoor atmosphere from the combustion of fuel gases, except where a continuous monitoring system is used for monitoring and recording the concentration of hydrogen sulfide in the fuel gas at any fuel gas combustion device. Fuel gas combustion devices having a common source of fuel gas may be monitored in one location;

(4) continuously monitoring and recording concentrations of sulfer dioxide in the emissions to the outdoor atmosphere from any new Claus sulfur recovery plant where compliance is achieved by burning of the tail gases; or continuously monitoring and recording concentrations of hydrogen sulfide and reduced sulfur compounds in the emissions to the outdoor atmosphere from any Claus sulfur recovery plant if compliance is achieved through the use of a reduction control system not followed by an afterburner.

(b) The average coke burn-off rate (thousands of kilograms/hr) and hours of operation for any fluid catalytic cracking unit catalyst regenerator subject to sections 223.3(b) and 223.5(b) of this Part shall be recorded daily.

(c) The source owner shall record daily the combustion rates of liquid or solid fossil fuels (liters/hr or kilograms/hr) and the hours of operation during which liquid or solid fossil fuels are combusted in the incinerator - waste heat boiler for any fluid catalytic cracking unit catalyst regenerator subject to section 223.3(b) of this Part and which utilizes an incinerator - waste heat boiler to combust the exhaust gases from the catalyst regenerator.

(d) Any person subject to the provisions of subdivisions (b) and (c) of this section shall maintain a file of the required measurements tabulated in a format acceptable to the commissioner.

(e) Such records of measurements shall be retained for a minimum of three years, and shall be furnished to the commissioner on his request.

(f) Any person subject to the provisions of subdivision (a) of this section shall submit a written report, at the request of the commissioner, of excess emissions of opacity and sulfur dioxide for each calendar quarter, and the nature and cause of the excessive emissions if known. For opacity measurements, the excess emissions report shall consist of the magnitude, in percent opacity, of all six-minute averages of opacity greater than the opacity standards in this Part for each hour of operation. For sulfur dioxide measurements, the excess emissions report shall include any six-hour period in which the average emissions (arithmetic average of six continuous one-hour periods) of sulfur dioxide exceed the standard under paragraphs (b)(2)-(3) of section 223.6 of this Part.

**Historical Note**

Sec. added by renum. 223.8, filed April 10, 1981;
amd. filed March 7, 1983 eff. 30 days after filing.

**223.10 Component leakage.** (a) The owner or operator of a petroleum refinery subject to this Part shall:

(1) Develop a monitoring program consistent with provisions of paragraph (b)(1) of this section.

(2) Conduct a monitoring program consistent with the provisions of subdivision (d) of this section.

(3) Record all leaking components which have a volatile organic compound concentration exceeding 10,000 ppm when tested according to the provisions of subdivision (c) of this section, and place an identifying tag on each component consistent with the provisions of paragraph (d)(7) of this section.

(4) If the leak can be repaired without a shutdown, repair and retest the leaking component as soon as possible but not later than 15 working days after the leak is found.

(5) If the leak cannot be repaired without a shutdown, identify all leaking components which cannot be repaired until the unit is shutdown for turnaround.

(6) The commissioner may require the rescheduling of a planned unit turnaround to an earlier date based on the number and severity of tagged leaks awaiting turnaround. Before requiring a rescheduled turnaround, the commissioner will consider the effect of the action on supplies of gasoline and heating oil, the availability of necessary repair equipment, and time requirements for contracting outside labor and rescheduling facility personnel.

(7) Except for safety pressure relief valves, no owner or operator of a petroleum refinery shall install or operate a valve at the end of a pipe or line containing volatile organic compounds unless the pipe or line is sealed with a second valve, a blind flange, a plug or a cap. The sealing device may be removed only when a sample is being taken or during maintenance operations.

(8) Pipeline valves and pressure relief valves in gas service for any volatile organic compound shall be marked in some manner that will be readily obvious to both refinery personnel performing monitoring and the commissioner.

(b) The owner or operator of a petroleum refinery shall meet the following schedule:

(1) submit to the commissioner and commence a monitoring program six months after the effective date of this Part. This program shall contain, as a minimum, a list of the refinery units and the quarter in which they will be monitored, a copy of the log book format, and the make and model of the monitoring equipment to be used. In no case shall a monitoring contract relieve the owner or operator of a petroleum refinery of the responsibility for compliance with this Part; and

(2) submit the first quarterly monitoring report to the commissioner six months after the approval of the monitoring program.

(c) Testing and calibration procedures to determine compliance with this Part must be consistent with Appendix B of the U.S. Environmental Protection Agency guideline series document, "Control of Volatile Organic Compound Leaks from Petroleum Refinery Equipment", EPA-450/2-78-036.

(d) The owner or operator of a petroleum refinery subject to this Part must:

(1) Monitor yearly by the methods referenced in subdivision (c) of this section, all pump seals, pipeline valves in liquid services, and process drains in gaseous or light petroleum compound service.

(2) Monitor quarterly by the methods referenced in subdivision (c) of this section, all compressor seals, pipeline valves in gaseous service and pressure relief valves in gas service.

(3) Monitor weekly by visual methods all pump seals in pumps in gaseous or light petroleum compound service.

(4) Monitor immediately any pump seal in pumps handling gases and light petroleum compounds from which liquids are observed dripping.

(5) Visually monitor any relief valve within 24 hours after it has vented to the atmosphere.

(6) Monitor within 72 hours after repair, any component that was found leaking.

(7) The owner or operator of a petroleum refinery, upon the detection of a leaking component, will affix a weatherproof and readily visible tag, bearing an identification number and the date the leak is located, to the leaking component. This tag must remain in place until the leaking component is repaired.

(e) The owner or operator of a petroleum refinery shall maintain a leaking components monitoring log specified in paragraph (a)(3) of this section, which shall contain at a minimum, the following data:

(1) the name of the process unit where the component is located;

(2) the type of component (*e.g.*, valve, seal);

(3) the tag number of the component;

(4) the date on which a leaking component is discovered;

(5) the date on which a leaking component is repaired;

(6) the date and instrument reading of the recheck procedure after a leaking component is repaired;

(7) a record of the calibration of the monitoring instrument;

(8) those leaks that cannot be repaired until turnaround;

(9) the total number of components checked and the total number of components found leaking; and

(10) copies of the monitoring log shall be retained by the owner or operator for a minimum of two years after the date on which the record was made or the report prepared, and shall be made available immediately to the commissioner or his representative, upon verbal or written request, at any reasonable time.

(f) *Reporting*. The owner or operator of a petroleum refinery, upon the completion of each yearly and/or quarterly monitoring procedure, shall:

(1) submit a report to the commissioner by the 15th day of January, April, July and October that lists all leaking components that were located during the previous three calendar months but not repaired within 15 days, all leaking components awaiting unit turnaround, the total number of components inspected and the total number of components found leaking; and

(2) submit a signed statement with the report attesting to the fact that, with the exception of those leaking components listed in paragraph (1) of this subdivision all monitoring and repairs were performed as stipulated in the monitoring program.

(g) If the owner or operator of a petroleum refinery can demonstrate to the satisfaction of the commissioner that the requirements of subdivisions (d), (e) and (f) of this section are not feasible, the commissioner may allow the application of alternative requirements.

**Historical Note**

Sec. filed April 10, 1981; amd. filed March 7, 1983 eff. 30 days after filing.